



Forest Health Protection

Pacific Southwest Region

Northeastern California Shared Service Area

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To: District Ranger, Almanor Ranger District, Lassen National Forest

Subject: Recommendations for hazard tree abatement within the High Lakes Off-Highway Vehicle Area, Lassen National Forest (FHP Report NE16-07)

Summary

At the request of Jennifer Erickson, Fuels Planner, Almanor Ranger District, Danny Cluck, Forest Health Protection (FHP) entomologist visited the southern end of the High Lakes Off-Highway Vehicle (OHV) area July 14 and 15, 2016. The objective of this visit was to evaluate the results of a recent OHV trailside hazard tree abatement project and to provide recommendations for future projects. Recommendations provided in this report will assist in the formulation of site specific hazard tree guidelines based on the Forest Health Protection “Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Regions” (Angwin et al 2012).

Key findings:

- The recent hazard tree abatement project successfully removed dead trees and most structurally defective trees in treated areas using the 2008 version of the Forest Health Protection, Northeastern California Shared Service Area hazard tree guidelines.
- Use of this older version of the FHP hazard tree guidelines may have resulted in the felling of a few trees that would not have met the 2012 FHP guidelines as well as leaving a few trees that would have met the 2012 FHP guidelines. Both instances are very minor based on field observations and did not negatively affect the success of the recent project.
- High severity burn areas were skipped during the recent effort due to unsafe conditions and future plans for using heavy equipment or other means to abate these patches of trees.
- Work should continue throughout the area using the 2012 FHP hazard tree guidelines as described in this report.

Description of the project area

The High Lakes OHV area is located approximately 31 miles northeast of Chico, CA (39.947962

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and 121.358215). The elevation ranges from approximately 3,900 to 6,900 feet with average annual precipitation ranging from 70 – 100 inches. Existing forest type is predominantly Sierra Nevada mixed conifer with ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Psuedotsuga menziesii*), sugar pine (*Pinus lambertiana*), incense cedar (*Calocedrus decurrens*), white fir (*Abies concolor*), red fir (*Abies magnifica*), lodgepole pine (*Pinus contorta*) and black oak (*Quercus kelloggii*). Species composition varies with elevation and aspect. Several wildfires have burned within this area over the past 16 years creating numerous snags and fire-injured green trees.

Management objectives

The short-term management objectives for this area are to reduce existing tree hazards along established OHV trails and dispersed camping areas. Long-term management includes monitoring and abating tree hazards as resources allow and educating High Lakes OHV area users of the dangers of dead and structurally defective trees.

Conditions that are contributing to tree hazards in the High Lakes OHV area

The number one agent that is contributing to tree hazards in the High Lakes OHV area is fire. Recent wildfires have killed thousands of trees and injured thousands more. Forest insects and diseases are also creating tree hazards by causing tree mortality or excessive decay within living trees. The following biotic agents were observed along OHV trails and dispersed campsites:

- Mountain pine beetle (*Dendroctonus ponderosae*)-caused mortality of sugar pine.
- White pine blister rust (*Cronartium ribicola*) cankers killing the tops of sugar pine.
- Fir engraver beetle (*Scolytus ventralis*)-caused mortality and top-kill of white and red fir.
- Dwarf mistletoe (*Arcuethobium* spp.) infections leading to bole cankers of red and white fir.
- Heterobasidion root disease (*Heterobasidion occidentale*) in true fir.
- Decay fungi (various species) in fire-injured trees.

Recommendations

Short-term: Within available resources, continue with the hazard tree abatement work started in 2015 with the following modifications. Complete hazard tree abatement for trailside and dispersed camping areas using the more recent 2012 guidelines adapted specifically for this project (Appendix A). This includes the recommendation of a 1½ x tree height target zone with modifications for slope. These guidelines may be applied with USFS marking crews that are trained by FHP staff. The exception to this would be for dead trees, which could be marked by private contractors hired to fell hazard trees. The suggested guidelines are generally more conservative in that only dead trees, structurally defective green trees with a high failure potential (with slight modifications based on local knowledge of decay and failure) and trees with multiple defects will be considered for felling. This approach is appropriate for low exposure/high frequency trail segments and dispersed camping areas along trails and remote lakes. Marking guidelines for higher use areas such as designated campsites around lakes should be more thorough and make use of the all hazard tree marking criteria as outlined in the 2012 FHP hazard tree guidelines.

Long-term: Within available resources, prioritize areas within the High Lakes OHV area to establish and implement a hazard tree monitoring program. Areas with known high use such as dispersed campsites around lakes where we have provided fire rings would be the highest priority for more frequent monitoring (*it should be noted that there are various USFS definitions of dispersed camping with some specifically stating that a dispersed campsite does NOT have fire rings or any other amenities. Other USFS definitions state that dispersed campsites may have very limited amenities, which may include fire rings. The district may decide if the placement of a fire rings technically makes these “designated” campsites. If so, and if the level of use is known to be similar to a high-use developed campground, more intensive and frequent hazard tree monitoring is recommended*). Next in priority would be OHV trails and dispersed campsites (no fire rings) with apparent low use. The level of monitoring and abatement would be commensurate with available resources as well as the results of any recent inspections (e.g. finding no mortality and very limited defect in green trees). While FHP generally recommends inspecting once a year for developed recreation areas, this is not practical or necessary for most of the High Lakes OHV area. The district could generally limit monitoring to every two to three years (or longer) based on the priorities described above. This is a reasonable approach due the high level of difficulty and costs associated with accessing this area.

Since it is not practical to monitor the majority of this area on an annual basis, the district may consider placing educational signs at the three main entry points of the High Lake OHV area. These signs would alert users to the dangers of hazard trees as well as how to identify and avoid them. FHP can provide poster and sign examples to district staff.

The large High Lakes OHV maps that are posted at each entrance could also be modified to remove the campground symbols from areas of dispersed camping. If these are not designated campsites recognized by the Lassen National Forest, they should not be advertised as such. A possible exception to this would be where the district has placed fire rings, which could technically make them designated campsites.

It is recommended that a registered borate compound be applied to all freshly cut conifer stumps >14” in diameter (excludes older dead trees with no attached foliage) to reduce the chance of creating new infection centers of *Heterobasidion irregulare* and *H. occidentale* formerly referred to as P-type and S-type annosus root disease, through hazard tree felling. For designated campsites, the R5 policy for developed recreation areas may be followed where all conifer stumps greater than 3” in diameter must be treated with a registered borate compound (FSM R5 Supplement 2300-92-1 modified by FSH R5 Supplement 3409.11-2010-1) within areas such as campgrounds, day-use areas and other high-use areas such as parking lots and boat ramps.

If you have any questions regarding this report and/or need additional information please contact Danny Cluck at 530-252-6431.

/s/ Danny Cluck

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Appendix A: Recommended guidelines for hazard tree abatement along OHV trails and dispersed camping areas (refer to site specific modifications below this table). *NOT FOR HIGH-USE DESIGNATED CAMPSITES*****

<u>Failure Potential (Defect)</u> 3 points = high potential for failure: serious defects. <u>Add 1 point</u> if multiple, interacting defects are present, e.g. leaning tree with other defects. Score 4 points (the maximum score) if tree is dead. <u>Cracks</u> High (3 points): - Crack goes completely through stem or branch. - Stem has two cracks on the same segment with a cavity or extensive decay. - Crack in contact with another defect or is at the base of a leaning tree. - Branch (4" or larger) with any crack. - Conifer stem with a single crack with inrolled bark and a cavity or decay inside. <u>Branch Unions/Forked Tops</u> High (3 points): - Weak branch union (V-shaped with inrolled bark) that is also cracked, cankered, decayed or streaming pitch. Strong (U-shaped) branch unions with these defects, except as listed below, should be assessed on the basis of the associated defects. - Heavy U-shaped branches of all species except for pines and incense cedar that form when branches turn up to become leaders. Pine and incense cedar receive a high rating only if an associated defect (cracked, cankered, decayed or streaming pitch) is also present at the branch union. - Large epicormic branches on decaying stems and branches. <u>Stem or Branch Decay</u> High (3 points): - Less than 1/3 of the tree's radius (or diameter) is sound. Additional sound wood needed if tree is leaning, decay is off-center or present between four feet above the groundline and the lowest live branch, or is associated with an open cavity. - Cavity, decay or fruiting body associated with an open crack or weak branch union. - Decay in a horizontal branch. - True fir and hardwoods with known, but unmeasured decay, especially if a cavity is open to the outside (refer to site specific modification) <u>Fungal Fruiting Bodies</u> High (3 points): <i>Phaeolus schweinitzii</i> conks associated with butt swell on Douglas-fir. - One or more Indian paint fungus (<i>Echinodontium tinctorium</i>) conks on true fir or hemlock (refer to site specific modification) - Five or more red ring rot (<i>Porodaedalia</i> (<i>Phellinus</i>) <i>pini</i>) conks on Douglas-fir, ponderosa pine, Jeffrey pine, lodgepole pine, or more than one on true fir or hemlock. - One or more quinine (<i>Fomitopsis officinalis</i>) conks on Douglas-fir, pines, western larch, spruce or hemlock. - One or more sulfur fungus (<i>Laetiporus sulphureus</i>) conks on a wide range of conifers and hardwoods, including Douglas-fir, true firs, pines, hemlocks, spruces, larch, western redcedar, oaks, maples, birch and willow.	<u>Cankers</u> High (3 points): - Cankers with associated fruiting bodies of decay fungi. - Cankers with associated internal decay. - Canker physically connected to a crack or other defect. - Single or multiple cankers without decay over more than 1/2 of the tree's circumference, particularly if the cankers are between four feet above the groundline and the lowest live branch. - Basal cankers in true fir that affect over 1/3 of the bole circumference. (refer to site specific modification) - Deep charring in true fir over more than 1/3 of the bole circumference when the relationship between deep char and cambial mortality has been confirmed. - Deep charring in sugar pine, ponderosa pine, Jeffrey pine, incense cedar or Douglas-fir over 1/2 of the bole circumference when the relationship between deep char and cambial mortality has been confirmed. <u>Dead Tree, Top Or Branches</u> Extremely High (4 points): - Dead tree. High (3 points): - Dead top greater than ten feet long or smaller ones with associated decay or other defect (note that old dead tops of pine, incense cedar, juniper or Douglas-fir may not have high failure potential). - Dead branches greater than two inches in diameter, branches that are hanging or lodged in the crown, large dead dwarf mistletoe brooms and large live dwarf mistletoe brooms with associated decay or defect. <u>Bark and/or Wood Boring Beetle-Attacked Trees</u> High (3 points) If any of the following over at least 1/3rd of the bole circumference (excluding basal attack by red turpentine beetle): - Pitch tubes with pink or reddish (not clear) boring dust. - Pouch fungus conks and/or current woodpecker (not sapsucker) activity. - Boring dust or frass in bark crevices, webbing along the bole, or accumulation of boring dust or frass at the base of the tree. 50% or more of the foliage-bearing crown actively fading, as indicated by a uniform change in color over that part of the crown. Dead tops that have no foliage do not count toward this 50%. Also does not include drought-induced needle cast (non-uniform fading restricted to the older needles) or branch mortality ("flagging") caused by dwarf mistletoe/<i>Cytospora</i> infections in true fir. <u>Root Damage and Root Disease</u> High (3 points): - Recently leaning trees, or with recent root-lifting, soil movement or mounding near the base, or with broken/decayed roots. - Inadequate root support, with more than half of the root system within the drip line severed, broken, undermined or decayed by erosion or excavation. - Host tree species visibly infected with root disease fungi, adjacent to visibly infected trees or stumps, or with advanced crown symptoms in the immediate area where Heterobasidion root disease has been identified. <u>Leans and Poor Tree Architecture</u> High (3 points): - Leaning with an angle greater than 45° from vertical. - Leaning with other contributing defects. - Freshly leaning tree with recent root lifting, soil movement or mounding near the base. - Lean associated with unstable soils or cracks in the tree. - Uncorrected lean compounded by unbalanced crown shape weighted in the direction of the lean. - Uncorrected lean at a location with frequent storm or wind injury.
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Site specific modifications:

Note: The following high failure potential (3 points) true fir may be retained since there is no evidence or history of a significant number of failures for these types of trees within the project area:

- A true fir with known, but unmeasured, decay that has > 50% healthy live crown ratio (no new or old branch dieback present).
- A true fir with up to four Indian paint fungus (*Echinodontium tinctorium*) conks that has > 50% healthy live crown ratio (no new or old branch dieback present).
- A true fir with a basal canker without decay over 1/3 of the bole circumference (but less than 1/2) but has > 50% healthy live crown ratio (no new or old branch dieback present).

These criteria assume that there are no other observable defects. One point should be added, and tree removed, if any other related defects are present (e.g. lean towards road prism, cracks in stem, root injury, etc.).

Marking guidelines for higher use areas such as designated campsites around lakes should be more thorough and make use of the all hazard tree marking criteria found in:

Angwin, P. A., Cluck D.R., Zambino P.J., Oblinger, B. W. and Woodruff W. C. *Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region*. 2012. Report # RO-12-01. 36 p.